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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/764,943	01/18/2001	Mathieu Tallegas	40535/JEC/X2	6947

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ALCATEL INTERNETWORKING, INC.  
ALCATEL-INTELLECTUAL PROPERTY DEPARTMENT  
3400 W. PLANO PARKWAY, MS LEGL2  
PLANO, TX 75075

EXAMINER

GEREZGIHER, YEMANE M

ART UNIT PAPER NUMBER

2144

DATE MAILED: 06/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/764,943

Applicant(s)

TALLEGAS ET AL.

Examiner

Yemane M Gerezgiher

Art Unit

2144

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-33 is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 05/04/2001.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

ymg

**DETAILED ACTION**

1. This application has been examined. Claims 1-33 are pending.

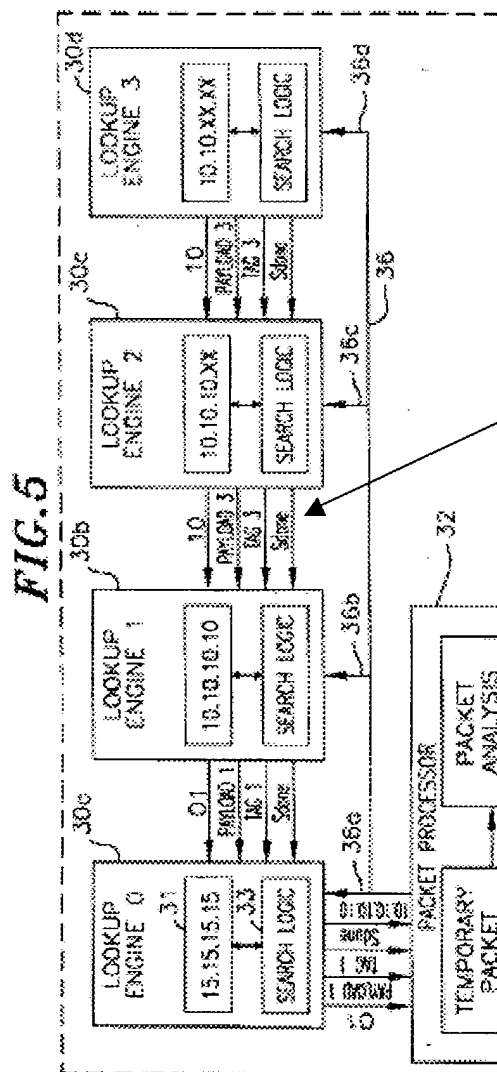
***Drawings***

2. Figure 1 is objected to because the inventive entity did not include a legend to point that the figure as presented was well known in the art. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
3. The drawings are objected to because Fig. 5 contains minor errors (See Fig. 5 below). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement

Art Unit: 2144

sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

According to the claimed invention,



According to the claimed invention, there is a minor problem in this Figure. Engine 3 transmits its result to engine 2, engine 2 generates its own result and comparison is made to select the best match from the two generated results. The inventive entity recites, "In an alternative embodiment, if a later lookup engine has a better match than an earlier lookup engine, the later lookup engine payload, match quality, and tag are validated and used. Lookup engine 2 also transmits to lookup engine 1 a search done signal." Further discloses, "If lookup engine 1 did not have a better match, it would have used lookup engine 2's payload, match quality, and tag." (See Specification Page 10, Lines 8-12 and 20-22. According to the claimed invention, the stack of lookup engines pass the best match from top lookup engine to the bottom lookup engine. According to the drawing, the result of engine 2 is better in terms of quality (longest matching prefix). Therefore, since the result of lookup engine 2 is better (longer prefix), engine 2 should pass the payload 2, tag 2 to lookup engine number 1. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Michels et al. (U.S. Patent Number 6,678,269) hereinafter referred to as Michels.

Michels disclosed a method for processing a data packet received by one of the data communication switches. Michels disclosed *creating a search key* and transmitting the created search key to pluralities of lookup/search engines in a communication switch *searching lookup tables* connected to every lookup engine's memory and forwarding search results using the forwarding logic located within each lookup engine and selecting a search result according to a longest prefix match. See Column 2, Lines 11-29 and Figure 2.

Since all the limitations of claim were disclosed, claim 1 is rejected.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harguchi et al. (U.S. Patent Number 6,665,297) hereinafter referred to as Harguchi in view of Kadambi et al. (U.S. Publication Number US 20020093974 A1) hereinafter referred to as Kadambi.

As per claim 1, Harguchi disclosed a routing technique by creating a search key and transmitting the search key to plurality of lookup/search engines where each lookup associated with distinct prefix length of a search key (claim 7) and generating search results associated with each lookup table and selecting in a selection stage by comparing the pluralities of search results to obtain the a search result with the longest prefix quality (claim 3). See Column 5, Lines 1-63. Harguchi disclosed transmitting the search key to the search/lookup tables in parallel (claim 2). See Column 5, Lines 50-63 and Fig. 2B. In Figure 2B, Harguchi disclosed a selection stage "88" where a result is selected according to the quality or longest prefix match (claim 3). See Column 6, Lines 10-16. Harguchi substantially disclosed the invention as claimed. However, Harguchi was silent regarding the three possible outcomes namely exact match, partial match or no match.

However, as evidenced by Kadambi, the three possibilities (exact match, partial match or no match) were known in the art at the time the invention was made. Kadambi disclosed receiving a search result in a lookup engine and dealing with the result

according to their quality (exact match, partial match or no match). See Page 12, Section [0153]. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to take commonly expected results of a search result as evidenced by the teachings of Kadambi related to the three possible search result qualities in a communication switch/router and have modified the teachings of Harguchi related to multiple lookup engine and lookup tables in a switch or a router in order to facilitate routing data packets efficiently.

***Allowable Subject Matter***

8. Claims 8-33 are allowed.
9. The following is a statement for the indication of allowable subject matter:

In combination with the remaining limitations of the claims, none of the prior art of record taken singularly or in combination taught or suggested a method or system implemented within a communication switch where a packet processor transmits a search key to plurality of lookup engines structured in a stack tendency where each lookup engine generates a search result and each result of one search/lookup engine is input in to another lookup engine to be compared with the result of the other lookup engine and to select one search result with highest quality by repeating the steps from top(beginning lookup engine) to bottom (last lookup engine) lookup engines in the stack formation. Further, as set forth in independent claims 8, 15 and 25, none of the prior art of record taken singularly or in combination taught or suggested a method or system transmitting a search key to the first lookup engine, generating a result at the first lookup engine and transmitting the first search result to a second lookup engine coupled

to the first lookup engine, the second lookup engine receiving the first search result and generating its own search result and comparing it with the result received from the first lookup engine and returning the best match quality (longest prefix). This functionality is supported by the present specification in Figure 5 and Pages 9-10.

### **Conclusion**

10. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

- a. Hebb, Andrew T. et al. (US 6711153 B1) entitled: *Route lookup engine*
- b. Schroeder, Jacob (US 6687715 B2) Entitled: *Parallel lookups that keep order*
- c. Merchant, Shashank et al. (US 6658015 B1) entitled: *Multiport switch with plurality of logic engines for simultaneously processing different respective data frames*
- d. Ganesh, Jayasenan Sundara et al. (US 6553000 B1) entitled: *Method and apparatus for forwarding network traffic*
- e. Sindhu, Pradeep S. et al. (US 6493347 B2) entitled: *Memory organization in a switching device*
- f. Hebb, Andrew T. et al. (US 6463067 B1) entitled: *Submission and response architecture for route lookup and packet classification requests*
- g. Waters, Gregory M. et al. (US 6430527 B1) entitled: *Prefix search circuitry and method*



- h. Kalkunte, Mohan et al. (US 20020012585 A1) entitled: *Gigabit switch with fast filtering processor*
- i. Muller, Shimon et al. (US 5938736 A) entitled: *Search engine architecture for a high performance multi-layer switch element*
- j. Ferguson, Dennis C. et al. (US 5909440 A) entitled: *High speed variable length best match look-up in a switching device*

#### NON PATENT DOCUMENTS

- k. Moestedt et al., "IP Address Lookup in Hardware for High-Speed Routing," IEEE Hot Interconnects VI, , Stanford, CA USA, August 1998, pp. 31-39.
- l. Waldvogel et al., "Scalable High Speed IP Routing Lookups." In Proc. of ACM SIGCOMM, September 1997, pages 25-36.

11. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Yemane Gerezgiher whose telephone number is 703-305-4874. The examiner can normally be reached on Monday- Friday from 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful. The examiner's supervisor, William Cuchlinski, can be reached at (703) 308-3873.

Yemane M. Gerezgiher  
AU 2144

MARC D. THOMPSON  
MARC THOMPSON  
PRIMARY EXAMINER  
703-308-6750